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ABSTRACT

In 1983-84, the Center for the Study of Community Colleges developed and field tested an instrument, the General Academic Assessment (GAA), to assess community college students' knowledge of several liberal arts areas, including mathematics. The GAA was completed by a sample of 8,024 students at four large, urban community college districts. The scores on the math portion of the test were cross tabulated by selected student characteristics (e.g., age, ethnicity, native language, and reason for attending college) and educational background variables (e.g., number of college units already completed, and number of math courses taken). Results of the analysis revealed that the highest mean GAA scores in mathematics were achieved by: (1) younger students recently graduated from high school; (2) students intending to transfer to a four-year college; and (3) students who rated their abilities in algebra as "excellent." GAA math scores also correlated positively with the number of semester hours completed and the number of mathematics courses completed. (UCM)

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Student Assessment - Mathematics

ERIC Digest
July 1984

ERIC Clearinghouse for Junior Colleges
8118 Math Sciences Building
UCLA

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ERIC DIGEST

July 1984

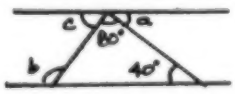
Student Assessment - Mathematics

In an effort to assess community college students' knowledge of the liberal arts, the Center for the Study of Community Colleges developed and field-tested a student survey and general academic assessment. This General Academic Assessment (GAA) has representative numbers of items in the humanities, sciences, social sciences, mathematics, and English usage. In addition, it contains such background items about the students as age, the number of college credits earned, educational and occupational aspirations, self-assessment of their skills, and the number of liberal-arts courses taken.

During 1983 and 1984, a sample of 8,824 students at four large urban community college districts (Los Angeles, Chicago, Miami-Dade, and St. Louis) completed the GAA instrument. The sample was obtained by taking every twentieth eligible class section in each of the districts' schedule of classes. Only sections with academic transfer-credits were eligible; students taking remedial classes, vocational-technical classes, adult education, or community services courses exclusively were not included.

This ERIC digest examines how well the students did on the mathematics portion of the GAA. The nature of the mathematics test items is first discussed, followed by a series of tables that detail scores by ethnicity, age, and educational background.

Test items in the mathematics section of the GAA assess student ability to solve problems as well as student knowledge in decimal, plane geometry, and basic algebra. Examples are provided below:



In the figure above, line 1 is parallel to line 2.

What is the measure of ∠a?

(A) 40°
(B) 50°
(C) 80°
(D) It is equal to the measure of ∠c
(E) Not enough information given

If a plane can fly 250 miles in 22 minutes, which equation could be used to determine x, the distance in miles that the plane can fly in 7.5 minutes at the same rate?

(A) $\frac{7.5}{x} = \frac{22}{250}$
(B) $\frac{x}{7.5} = \frac{22}{250}$
(C) $\frac{7.5}{22} = \frac{250}{x}$
(D) $(7.5 + 22)(250) = x$

The items were provided by the National Assessment of Educational Progress and selected by a panel of staff members from community colleges in Chicago, Dallas, Los Angeles, Miami, Phoenix, and St. Louis. Each form of the GAA includes 10 mathematics items.

Scores on the mathematics section of the GAA are converted to a point on a one-to-ten scale.

In the following tables, the GAA scores are cross tabulated by selected Student Characteristic variables and selected Educational background variables. Student characteristics encompass age, ethnicity, native language, and reason for attending college; Educational background variables include the number of college units already completed by the student, and the number of math courses that the student has taken prior to the GAA test. Each table shows, in rank order, the mean mathematics score on a scale of 1 to 10.

I. GAA Scores Cross Tabulated by Student Characteristics

A. Mean Scores by Student Age

In general, younger students who have recently graduated from high school performed better than their older colleagues.

Student Age	Mean	Number
20 years or less	5.01	3,215
21 - 30	4.89	3,245
Over 50	4.61	176
31 - 40	4.61	896
41 - 50	4.86	386
Entire Population	4.87	7,836

B. Mean Scores by Ethnic Group

Data comparing the scores of students who had completed 0-14 college units with the scores of students who had completed 60 or more units indicate that there are no great differences among ethnic groups in the rate of gain in math skills between students beginning college and those who have completed 60 or more units.

Ethnic Group	Mean	N	Mean	N	Differential
	0-14 Units		60 or more units		
Asian	4.85	166	5.96	138	1.11
Black	3.47	550	4.37	278	.90
Hispanic	4.17	429	5.00	197	.83
White	5.12	936	6.25	567	1.13
Other	4.41	79	4.60	52	.19

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C. Mean Scores by Whether or not English is the Native Language

The native language of the student does not seem to be a significant factor when all ethnic groups are merged. However, when examined by ethnic group, native English speakers with the exception of Asians scored higher than non-native English speakers. The rate of difference between Blacks and Hispanics is revealed to be about the same.

Ethnic Group	Mean/Yes	N	Mean/No	N	Differential
Asian	4.87	288	5.37	549	.50
Black	3.88	1,894	3.51	111	.29
Hispanic	4.72	599	4.49	817	.23
White	5.64	3,827	5.09	265	.55
Other	4.78	223	4.59	100	.11

D. Mean Scores by Reason for Attending College

Students attend community colleges for a variety of reasons. Those intending to transfer scored higher than those attending for personal interest or vocational training.

Reason for Attending	Mean	Number
Transfer	5.13	4,453
Personal Interest	4.57	568
Advance in Present Occupation	4.54	782
Enter an Occupation	4.47	2,139
Entire Population	4.86	7,862

E. Mean Scores by Self-Assessment of Algebraic Skills

Students taking the GAA were asked to rate their own ability to use algebra to solve problems as compared to other students at their college. Those who rated themselves highly also scored high on the mathematical section of the GAA.

Rating	Mean	Number
Excellent	6.17	1,583
Good	5.16	2,464
Fair	4.49	2,239
Poor	3.82	1,698
Entire Population	4.88	7,984

II. GAA Scores Cross Tabulated by Educational Background

A. Mean Scores by Number of Completed College Units

There appears to be a positive correlation between the number of semester hours completed and scores on the mathematical section of the GAA.

Number of Units Completed	Mean	Number
60 or more	5.51	1,265
45 - 59	5.18	1,835
30 - 44	4.88	1,396
15 - 29	4.84	1,635
0 - 14	4.45	2,213
Entire Population	4.89	7,564

B. Mean Scores by Number of Math Courses Taken

Not surprisingly, there was a positive correlation between the number of math courses taken and the students' GAA math scores.

No. of Math Courses	Mean	Number
Three or more	5.91	1,636
Two courses	5.08	1,264
One Course	4.63	1,921
None	4.41	2,640
Entire Population	4.91	7,461

The GAA is meant to assess students' knowledge of the liberal arts in community colleges. The mathematical section, as well as the others, was designed specifically to assess the learning of cohorts of students, not individual students. The data from the GAA will be used as a tool to aid in program planning, curricular modifications, and to gauge institutional outcomes. More information about the GAA may be obtained from:

Center for the Study of Community Colleges
Research Director: Florence B. Brawer
1047 Gayley Avenue
Los Angeles, CA 90024

Riley, Michelle. The Community College General Academic Assessment: Los Angeles District, 1983. Los Angeles: Center for the Study of Community Colleges, 1984.
ED number not yet assigned.

Riley, Michelle. The Community College General Academic Assessment: Miami-Dade Community College District, 1983. Los Angeles: Center for the Study of Community Colleges, 1984.
ED number not yet assigned.

ERIC Digests examining other sections of the GAA are available from the ERIC Clearinghouse for Junior Colleges; 8118 Math Sciences Building; UCLA; Los Angeles, California 90024.

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